INDIANA DEPARTMENT OF TRANSPORTATION

INTER-DEPARTMENT COMMUNICATION

Standards Section – Room N642

Writer's Direct Line
232-6775

October 12, 2004

DESIGN MEMORANDUM No. 04-11
TECHNICAL ADVISORY

TO: **All Design, Operations, District Personnel, and Consultants**

FROM: ***/s/ Anthony L. Uremovich***
Anthony L. Uremovich
Design Policy Engineer
Contracts and Construction Division

SUBJECT: **Empirical Design of Concrete Bridge Decks**

EFFECTIVE: **January 19, 2005, Letting**

Empirical design of concrete bridge decks may be used in accordance with the AASHTO *LRFD Bridge Design Specifications* to design a deck supported on beams or girders if all of the following conditions, in addition to those in *LRFD Bridge Design Specifications* Section 9.7.2.4, are met.

1. The design year AADT is less than 5000.

2. The skew angle is less than or equal to 20 deg.

3. The design year ADTT (average daily truck traffic) is less than 500.

This applies to bridge rehabilitation which includes deck replacement, and new bridge construction. Empirical design of the deck may be used even though the remainder of the structure is designed using the Load Factor method.

The coping overhangs should be designed in accordance with *LRFD*. For a continuous structure, the negative moment reinforcing steel in the deck should be designed in accordance with the Load Factor method.

LRFD requires four layers of isotropic reinforcement. For each of the two top layers, the minimum steel area is 380 mm^2/m (0.18 $in.^2/ft$) For each of the bottom two layers, the minimum steel area is 570 mm^2/m (0.27 $in.^2/ft$). The recommended minimum reinforcing bars sizes and spacings for constructability and crack control are as follows:

Two top layers, #13 @ 300 mm (#4 @ 12 in.)
Two bottom layers, #16 @ 300 mm (#5 @ 12 in.)

If empirical design is used for the deck, a memorandum should be sent to the Design Division Chief so that a database can be kept of each such bridge.

A contractor will not be permitted to submit a cost reduction incentive proposal to redesign a deck designed using the AASHTO *Standard Specifications for Highway Bridges*.

[F:\Des\Signed\0411-ta.doc]